

General

Title

Total hip arthroplasty (THA) and/or total knee arthroplasty (TKA): hospital-level risk-standardized complication rate (RSCR) following elective primary THA and/or TKA.

Source(s)

Yale New Haven Health Services Corporation (YNHHSC), Center for Outcomes Research and Evaluation (CORE). 2017 procedure-specific measure updates and specifications report: hospital-level risk-standardized complication measure. Baltimore (MD): Centers for Medicare & Medicaid Services (CMS); 2017 Mar. 41 p.

Measure Domain

Primary Measure Domain

Clinical Quality Measures: Outcome

Secondary Measure Domain

Does not apply to this measure

Brief Abstract

Description

This measure estimates a hospital-level risk-standardized complication rate (RSCR) following an elective primary total hip arthroplasty (THA) and/or total knee arthroplasty (TKA). The outcome (complication) is defined as any one of the specified complications occurring up to 90 days following the start of the index admission. The hospital that performed the procedure is the one held accountable for the measure outcome (complication or no complication).

The Centers for Medicare & Medicaid Services (CMS) annually reports the measure for individuals who are 65 years and older and are Medicare Fee-for-Service (FFS) beneficiaries hospitalized in non-federal short-term acute care hospitals (including Indian Health Services hospitals) and critical access hospitals.

Rationale

Total hip arthroplasty (THA) and total knee arthroplasty (TKA) are commonly performed procedures that improve quality of life. In 2003 there were 202,500 THAs and 402,100 TKAs performed (Kurtz et al., "Projections," 2007) and the number of procedures performed has increased steadily over the past decade (Kurtz et al., "Future," 2007; Ong et al., 2006).

Although these procedures dramatically improve quality of life, they are costly. In 2005 annual hospital charges totaled \$3.95 billion and \$7.42 billion for primary THA and TKA, respectively (Kurtz et al., "Future," 2007). These costs are projected to increase by 340% to \$17.4 billion for THA and by 450% to \$40.8 billion for TKA by 2015 (Kurtz et al., "Future," 2007). Medicare is the single largest payer for these procedures, covering approximately two-thirds of all THAs and TKAs performed in the U.S. (Ong et al., 2006). Combined, THA and TKA procedures account for the largest procedural cost in the Medicare budget (Bozic et al., 2008).

Because these are commonly performed and costly procedures, it is imperative to address quality of care. Complications increase costs associated with THA and TKA and affect the quality, and potentially quantity, of life for patients. Although complications following elective THA and TKA are rare, the results can be devastating. Rates for periprosthetic joint infection following THA and TKA range from 1.6% to 2.3%, depending upon the population (Bongartz et al., 2008; Kurtz et al., 2010). Reported 90-day death rates following THA range from 0.7% (Soohoo et al., 2010) to 2.7% (Cram et al., 2007). Rates for pulmonary embolism following TKA range from 0.5% to 0.9% (Cram et al., 2007; Mahomed et al., 2003; Khatod et al., 2008; Solomon et al., 2006). Rates for wound infection in Medicare population-based studies vary between 0.3% and 1.0% (Cram et al., 2007; Mahomed et al., 2003; Solomon et al., 2006). Rates for septicemia range from 0.1%, during the index admission (Browne et al., 2010) to 0.3%, 90 days following discharge for primary TKA (Cram et al., 2007). Rates for bleeding and hematoma following TKA range from 0.94% (Browne et al., 2010) to 1.7% (Huddleston et al., 2009).

Furthermore, hospitals vary in their rate of complications. Analyses in Medicare fee-for-service (FFS) patients (2008 to 2010) demonstrate a median hospital-level risk-standardized complication rate (RSCR) of 3.5% (range 1.8% to 8.9%) after elective primary THA and/or TKA, suggesting room for improvement in clinical care.

The variation in complication rates across hospitals suggests there are considerable differences in the quality of care at the hospital level. Measuring and reporting risk-standardized complications rates will inform health care providers about opportunities to improve care, strengthen incentives for quality improvement, and promote improvements in the quality of care received by patients and the outcomes they experience. The measure will also provide patients with information that could guide their choices regarding where they seek care for these elective procedures. Furthermore, the measure will increase transparency for consumers and has the potential to lower health care costs due to costly readmissions associated with these complications.

Evidence for Rationale

Bongartz T, Halligan CS, Osmon DR, Reinalda MS, Bamlet WR, Crowson CS, Hanssen AD, Matteson EL. Incidence and risk factors of prosthetic joint infection after total hip or knee replacement in patients with rheumatoid arthritis. *Arthritis Rheum.* 2008 Dec 15;59(12):1713-20. [PubMed](#)

Bozic KJ, Rubash HE, Sculco TP, Berry DJ. An analysis of Medicare payment policy for total joint arthroplasty. *J Arthroplasty.* 2008 Sep;23(6 Suppl 1):133-8. [PubMed](#)

Browne JA, Cook C, Hofmann AA, Bolognesi MP. Postoperative morbidity and mortality following total knee arthroplasty with computer navigation. *Knee.* 2010 Mar;17(2):152-6. [PubMed](#)

Cram P, Vaughan-Sarrazin MS, Wolf B, Katz JN, Rosenthal GE. A comparison of total hip and knee replacement in specialty and general hospitals. *J Bone Joint Surg Am.* 2007 Aug;89(8):1675-84.

Huddleston JI, Maloney WJ, Wang Y, Verzier N, Hunt DR, Herndon JH. Adverse events after total knee arthroplasty: a national Medicare study. *J Arthroplasty*. 2009 Sep;24(6 Suppl):95-100. [PubMed](#)

Khatod M, Inacio M, Paxton EW, Bini SA, Namba RS, Burchette RJ, Fithian DC. Knee replacement: epidemiology, outcomes, and trends in Southern California: 17,080 replacements from 1995 through 2004. *Acta Orthop*. 2008 Dec;79(6):812-9. [PubMed](#)

Kurtz S, Ong K, Lau E, Bozic K, Berry D, Parvizi J. Prosthetic joint infection risk after TKA in the Medicare population. *Clin Orthop Relat Res*. 2010;468:5.

Kurtz S, Ong K, Lau E, Mowat F, Halpern M. Projections of primary and revision hip and knee arthroplasty in the United States from 2005 to 2030. *J Bone Joint Surg Am*. 2007 Apr;89(4):780-5. [PubMed](#)

Kurtz SM, Ong KL, Schmier J, Mowat F, Saleh K, Dybvik E, Karrholm J, Garellick G, Havelin LI, Furnes O, Malchau H, Lau E. Future clinical and economic impact of revision total hip and knee arthroplasty. *J Bone Joint Surg Am*. 2007 Oct;89 Suppl 3:144-51. [PubMed](#)

Mahomed NN, Barrett JA, Katz JN, Phillips CB, Losina E, Lew RA, Guadagnoli E, Harris WH, Poss R, Baron JA. Rates and outcomes of primary and revision total hip replacement in the United States Medicare population. *J Bone Joint Surg Am*. 2003 Jan;85-A(1):27-32. [28 references] [PubMed](#)

Ong KL, Mowat FS, Chan N, Lau E, Halpern MT, Kurtz SM. Economic burden of revision hip and knee arthroplasty in Medicare enrollees. *Clin Orthop Relat Res*. 2006 May;446:22-8. [PubMed](#)

Solomon DH, Chibnik LB, Losina E, Huang J, Fossel AH, Husni E, Katz JN. Development of a preliminary index that predicts adverse events after total knee replacement. *Arthritis Rheum*. 2006 May;54(5):1536-42. [PubMed](#)

Soohoo NF, Farng E, Lieberman JR, Chambers L, Zingmond DS. Factors that predict short-term complication rates after total hip arthroplasty. *Clin Orthop Relat Res*. 2010 Sep;468(9):2363-71. [PubMed](#)

Yale New Haven Health Services Corporation (YNHHSC), Center for Outcomes Research & Evaluation (CORE). Hospital-level risk-standardized complication rate following elective primary total hip arthroplasty (THA) and/or total knee arthroplasty (TKA): measure methodology report. Baltimore (MD): Centers for Medicare & Medicaid Services (CMS); 2012 Jun 25. 90 p. [23 references]

Primary Health Components

Elective primary total hip arthroplasty (THA); total knee arthroplasty (TKA); complication rate

Denominator Description

The measure cohort consists of admissions for Medicare Fee-for-Service (FFS) beneficiaries aged 65 years and older discharged from non-federal acute care or critical access hospitals, having a qualifying elective primary total hip arthroplasty (THA) and/or total knee arthroplasty (TKA) procedure.

The risk-standardized complication rate (RSCR) is calculated as the ratio of the number of "predicted" admissions with a complication to the number of "expected" admissions with a complication at a given hospital, multiplied by the national observed complication rate. For each hospital, the denominator is the

number of admissions with a complication expected based on the nation's performance with that hospital's case mix.

See the related "Denominator Inclusions/Exclusions" field.

Note: This outcome measure does not have a traditional numerator and denominator like a core process measure; thus, this field is used to define the measure cohort.

See the *2017 Procedure-specific Complication Measure Updates and Specifications Report* for more details.

Numerator Description

The outcome for this measure is any complication occurring during the index admission (not coded present on arrival) to 90 days post-date of the index admission.

Complications are counted in the measure only if they occur during the index hospital admission or during a readmission. The measure defines a "complication" as:

Acute myocardial infarction (AMI), pneumonia, or sepsis/septicemia/shock during the index admission or a subsequent inpatient admission that occurs within seven days from the start of the index admission;

Surgical site bleeding or pulmonary embolism during the index admission or a subsequent inpatient admission within 30 days from the start of the index admission;

Death during the index admission or within 30 days from the start of the index admission; or,

Mechanical complication or periprosthetic joint infection/wound infection during the index admission or a subsequent inpatient admission that occurs within 90 days from the start of the index admission.

The risk-standardized complication rate (RSCR) is calculated as the ratio of the number of "predicted" admissions with a complication to the number of "expected" admissions with a complication at a given hospital, multiplied by the national observed complication rate. For each hospital, the numerator of the ratio is the number of admissions with a complication within 90 days predicted based on the hospital's performance with its observed case mix.

See the related "Numerator Inclusions/Exclusions" field.

Note: This outcome measure does not have a traditional numerator and denominator like a core process measure; thus, this field is used to define the outcome.

See the *2017 Procedure-specific Complication Measure Updates and Specifications Report* for more details.

Evidence Supporting the Measure

Type of Evidence Supporting the Criterion of Quality for the Measure

One or more research studies published in a National Library of Medicine (NLM) indexed, peer-reviewed journal

Additional Information Supporting Need for the Measure

In 2010, there were 168,000 total hip arthroplasties (THAs) and 385,000 total knee arthroplasties (TKAs) performed on Medicare beneficiaries 65 years and older (National Center for Health Statistics [NCHS], 2010). Although these procedures dramatically improve quality of life, they are costly. In 2005, annual hospital charges totaled \$3.95 billion and \$7.42 billion for primary THA and TKA, respectively (Kurtz et al., 2007). These costs are projected to increase by 340% to 17.4 billion for THA and by 450% to 40.8 billion for TKA by 2015 (Kurtz et al., 2007). Medicare is the single largest payer for these procedures, covering approximately two-thirds of all THAs and TKAs performed in the United States (U.S.) (Ong et al.,

2006). Combined, THA and TKA procedures account for the largest procedural cost in the Medicare budget (Bozic et al., 2008).

Since THAs and TKAs are commonly performed and costly procedures, it is imperative to address quality of care. Complications increase costs associated with THA and TKA and affect the quality, and potentially quantity, of life for patients. Although complications following elective THA and TKA are rare, the results can be devastating. Rates for periprosthetic joint infection following THA and TKA range from 1.6% to 2.3%, depending upon the population (Bongartz et al., 2008; Kurtz et al., 2010). Reported 90-day death rates following THA range from 0.7% (Soohoo et al., 2010) to 2.7% (Cram et al., 2007). Rates for pulmonary embolism following TKA range from 0.5% to 0.9% (Cram et al., 2007; Mahomed et al., 2003; Khatod et al., 2008; Solomon et al., 2006). Rates for wound infection in Medicare population-based studies vary between 0.3% and 1.0% (Cram et al., 2007; Mahomed et al., 2003; Solomon et al., 2006). Rates for septicemia range from 0.1%, during the index admission (Browne et al., 2010) to 0.3%, 90 days following discharge for primary TKA (Cram et al., 2007). Rates for bleeding and hematoma following TKA range from 0.94% (Browne et al., 2010) to 1.7% (Huddleston et al., 2009).

The variation in complication rates across hospitals indicates there is room for quality improvement and targeted efforts to reduce these complications could result in better patient care and potential cost savings.

Measurement of patient outcomes allows for a comprehensive view of quality of care that reflects complex aspects of care such as communication between providers and coordinated transitions to the outpatient environment. These aspects are critical to patient outcomes, and are broader than what can be captured by individual process of care measures.

The THA/TKA hospital-specific risk-standardized complication rate (RSCR) measure is thus intended to inform quality-of-care improvement efforts, as individual process-based performance measures cannot encompass all the complex and critical aspects of care within a hospital that contribute to patient outcomes.

Evidence for Additional Information Supporting Need for the Measure

Bongartz T, Halligan CS, Osmon DR, Reinalda MS, Bamlet WR, Crowson CS, Hanssen AD, Matteson EL. Incidence and risk factors of prosthetic joint infection after total hip or knee replacement in patients with rheumatoid arthritis. *Arthritis Rheum.* 2008 Dec 15;59(12):1713-20. [PubMed](#)

Bozic KJ, Rubash HE, Sculco TP, Berry DJ. An analysis of Medicare payment policy for total joint arthroplasty. *J Arthroplasty.* 2008 Sep;23(6 Suppl 1):133-8. [PubMed](#)

Browne JA, Cook C, Hofmann AA, Bolognesi MP. Postoperative morbidity and mortality following total knee arthroplasty with computer navigation. *Knee.* 2010 Mar;17(2):152-6. [PubMed](#)

Cram P, Vaughan-Sarrazin MS, Wolf B, Katz JN, Rosenthal GE. A comparison of total hip and knee replacement in specialty and general hospitals. *J Bone Joint Surg Am.* 2007 Aug;89(8):1675-84. [PubMed](#)

Huddleston JI, Maloney WJ, Wang Y, Verzier N, Hunt DR, Herndon JH. Adverse events after total knee arthroplasty: a national Medicare study. *J Arthroplasty.* 2009 Sep;24(6 Suppl):95-100. [PubMed](#)

Khatod M, Inacio M, Paxton EW, Bini SA, Namba RS, Burchette RJ, Fithian DC. Knee replacement: epidemiology, outcomes, and trends in Southern California: 17,080 replacements from 1995 through 2004. *Acta Orthop.* 2008 Dec;79(6):812-9. [PubMed](#)

Kurtz S, Ong K, Lau E, Bozic K, Berry D, Parvizi J. Prosthetic joint infection risk after TKA in the

Medicare population. Clin Orthop Relat Res. 2010;468:5.

Kurtz SM, Ong KL, Schmier J, Mowat F, Saleh K, Dybvik E, Karrholm J, Garellick G, Havelin LI, Furnes O, Malchau H, Lau E. Future clinical and economic impact of revision total hip and knee arthroplasty. J Bone Joint Surg Am. 2007 Oct;89 Suppl 3:144-51. [PubMed](#)

Mahomed NN, Barrett JA, Katz JN, Phillips CB, Losina E, Lew RA, Guadagnoli E, Harris WH, Poss R, Baron JA. Rates and outcomes of primary and revision total hip replacement in the United States Medicare population. J Bone Joint Surg Am. 2003 Jan;85-A(1):27-32. [28 references] [PubMed](#)

National Center for Health Statistics (NCHS). National Hospital Discharge Survey: number of all-listed procedures for discharges from short-stay hospitals, by procedure category and age: United States, 2010. Atlanta (GA): Centers for Disease Control and Prevention (CDC); 2010. 2 p.

Ong KL, Mowat FS, Chan N, Lau E, Halpern MT, Kurtz SM. Economic burden of revision hip and knee arthroplasty in Medicare enrollees. Clin Orthop Relat Res. 2006 May;446:22-8. [PubMed](#)

Solomon DH, Chibnik LB, Losina E, Huang J, Fossel AH, Husni E, Katz JN. Development of a preliminary index that predicts adverse events after total knee replacement. Arthritis Rheum. 2006 May;54(5):1536-42. [PubMed](#)

Soohoo NF, Farnig E, Lieberman JR, Chambers L, Zingmond DS. Factors that predict short-term complication rates after total hip arthroplasty. Clin Orthop Relat Res. 2010 Sep;468(9):2363-71. [PubMed](#)

Extent of Measure Testing

Assessment of Updated Models

The total hip arthroplasty (THA)/total knee arthroplasty (TKA) complication measure estimates hospital-specific risk-standardized complication rates (RSCRs) using a hierarchical logistic regression model. Refer to Section 2 in the original measure documentation for a summary of the measure methodology and model risk-adjustment variables. Refer to prior methodology and technical reports for further details.

The Centers for Medicare & Medicaid Services (CMS) evaluated and validated the performance of the model, using April 2013 to March 2016 data for the 2017 reporting period. They also evaluated the stability of the risk-adjustment model over the three-year measurement period by examining the model variable frequencies, model coefficients, and the performance of the risk-adjustment model in each year.

CMS assessed logistic regression model performance in terms of discriminant ability for each year of data and for the three-year combined period. They computed two summary statistics for assessing model performance: the predictive ability and the area under the receiver operating characteristic (ROC) curve (c-statistic). CMS also computed between-hospital variance for each year of data and for the three-year combined period. If there were no systematic differences between hospitals, the between-hospital variance would be zero.

The results of these analyses for the measure are presented in Section 4.2 of the original measure documentation.

THA/TKA Complication 2017 Model Results

Frequency of THA/TKA Model Variables

CMS examined the change in the frequencies of clinical and demographic variables. Frequencies of model variables were stable over the measurement period. There were no large changes (greater than 2% absolute change) in the frequencies. However, the increases in frequencies of Morbid obesity and Renal

failure observed in 2016 public reporting continue, but only by 0.8% and 1.1%, respectively, over the three-year period.

THA/TKA Model Parameters and Performance

Table 4.2.2 in the original measure documentation shows hierarchical logistic regression model variable coefficients by individual year and for the combined three-year dataset. Table 4.2.3 in the original measure documentation shows the risk-adjusted odds ratios (ORs) and 95% confidence intervals for the THA/TKA complication model by individual year and for the combined three-year dataset. Overall, the variable effect sizes were relatively constant across years. In addition, model performance was stable over the three-year time period; the c-statistic remained constant at 0.65.

Evidence for Extent of Measure Testing

Yale New Haven Health Services Corporation (YNHHSC), Center for Outcomes Research and Evaluation (CORE). 2017 procedure-specific measure updates and specifications report: hospital-level risk-standardized complication measure. Baltimore (MD): Centers for Medicare & Medicaid Services (CMS); 2017 Mar. 41 p.

State of Use of the Measure

State of Use

Current routine use

Current Use

not defined yet

Application of the Measure in its Current Use

Measurement Setting

Hospital Inpatient

Professionals Involved in Delivery of Health Services

not defined yet

Least Aggregated Level of Services Delivery Addressed

Single Health Care Delivery or Public Health Organizations

Statement of Acceptable Minimum Sample Size

Specified

Target Population Age

Age greater than or equal to 65 years

Target Population Gender

Either male or female

National Strategy for Quality Improvement in Health Care

National Quality Strategy Aim

Better Care

National Quality Strategy Priority

Making Care Safer

Prevention and Treatment of Leading Causes of Mortality

Institute of Medicine (IOM) National Health Care Quality Report Categories

IOM Care Need

Getting Better

IOM Domain

Effectiveness

Safety

Data Collection for the Measure

Case Finding Period

Discharges April 1, 2013 through March 31, 2016

Denominator Sampling Frame

Patients associated with provider

Denominator (Index) Event or Characteristic

Institutionalization

Patient/Individual (Consumer) Characteristic

Therapeutic Intervention

Denominator Time Window

not defined yet

Denominator Inclusions/Exclusions

Inclusions

An *index admission* is the hospitalization to which the complication outcome is attributed and includes admissions for patients:

- Having a qualifying elective primary total hip arthroplasty (THA)/total knee arthroplasty (TKA) procedure* during the index admission;
- Enrolled in Medicare Fee-for-Service (FFS) Part A and Part B for the 12 months prior to the date of admission, and enrolled in Part A during the index admission; and,
- Aged 65 or over.

Elective primary THA/TKA procedures are defined as those THA/TKA procedures without any of the following:

- Fracture of the pelvis or lower limbs coded in the principal or secondary discharge diagnosis fields of the index admission;
- A concurrent partial hip arthroplasty;
- A concurrent revision, resurfacing, or implanted device/prosthesis removal procedure;
- Mechanical complication coded in the principal discharge diagnosis field of the index admission;
- Malignant neoplasm of the pelvis, sacrum, coccyx, lower limbs, or bone/bone marrow or a disseminated malignant neoplasm coded in the principal discharge diagnosis field; or,
- Transfer from another acute care facility for the THA/TKA. (Note: The THA/TKA complication measure excludes index admissions for patients who are transferred in to the index hospital from another hospital, as these admissions likely do not represent elective THA/TKA procedures.)

*International Classification of Diseases, Tenth Revision, Procedure Coding System (ICD-10-PCS) codes used to define a THA/TKA procedure in claims for discharges on or after October 1, 2015 are listed in the original measure documentation. International Classification of Diseases, Ninth Revision (ICD-9) code lists for discharges prior to October 1, 2015 can be found in the [2016 Procedure-Specific Measure Updates and Specifications Report Hospital-Level Risk-Standardized Complication Measure: Elective Primary Total Hip Arthroplasty \(THA\) and/or Total Knee Arthroplasty \(TKA\) – Version 5.0](#) .

Exclusions

The THA/TKA complication measure excludes index admissions for patients:

- Without at least 90 days post-discharge enrollment in Medicare FFS;
- Discharged against medical advice; or,
- With more than two THA/TKA procedure codes during the index admission.

For patients with more than one eligible admission for a THA/TKA procedure in a given year, only one index admission is randomly selected for inclusion in the cohort. Additional admissions within that year are excluded.

Exclusions/Exceptions

not defined yet

Numerator Inclusions/Exclusions

Inclusions

The outcome for this measure is any complication occurring during the index admission (not coded present on arrival) to 90 days post-date of the index admission.

Complications are counted in the measure only if they occur during the index hospital admission or during a readmission. The measure defines a "complication" as:

Acute myocardial infarction (AMI), pneumonia, or sepsis/septicemia/shock during the index admission or a subsequent inpatient admission that occurs within seven days from the start of the index admission;

Surgical site bleeding or pulmonary embolism during the index admission or a subsequent inpatient admission within 30 days from the start of the index admission;

Death during the index admission or within 30 days from the start of the index admission; or,

Mechanical complication or periprosthetic joint infection/wound infection during the index admission or a subsequent inpatient admission that occurs within 90 days from the start of the index admission.

The risk-standardized complication rate (RSCR) is calculated as the ratio of the number of "predicted" admissions with a complication to the number of "expected" admissions with a complication at a given hospital, multiplied by the national observed complication rate. For each hospital, the numerator of the ratio is the number of admissions with a complication within 90 days predicted based on the hospital's performance with its observed case mix.

Note: This outcome measure does not have a traditional numerator and denominator like a core process measure; thus, this field is used to define the outcome.

The outcome for this measure is any one of the specified complications occurring during the index admission or during a readmission except for deaths, which can occur anywhere as long as it is within 30 days of the start of the index admission. The measure assesses a dichotomous yes or no outcome of whether each admitted patient experiences one or more of the complications defined above. Therefore, if a patient experiences one or more complications in the applicable time period, the outcome variable is coded as a "yes."

See the [2017 Procedure-Specific Measure Updates and Specifications Report Hospital-Level Risk-Standardized Complication Measure: Elective Primary Total Hip Arthroplasty \(THA\) and/or Total Knee Arthroplasty \(TKA\) – Version 6.0](#) for more details.

Exclusions

The measure captures all complications occurring during the index admission, regardless of when they occur, with the exception of complications that are coded as present on admission (POA).

Numerator Search Strategy

Institutionalization

Data Source

Administrative clinical data

Type of Health State

Adverse Health State

Instruments Used and/or Associated with the Measure

None

Computation of the Measure

Measure Specifies Disaggregation

Does not apply to this measure

Scoring

Rate/Proportion

Interpretation of Score

Desired value is a lower score

Allowance for Patient or Population Factors

not defined yet

Description of Allowance for Patient or Population Factors

Risk-Adjustment Variables

In order to account for differences in case mix among hospitals, the measure adjusts for variables (for example, age, comorbid diseases, and indicators of patient frailty) that are clinically relevant and have relationships with the outcome. For each patient, risk-adjustment variables are obtained from inpatient, outpatient, and physician Medicare administrative claims data extending 12 months prior to, and including, the index admission.

The measure adjusts for case mix differences among hospitals based on the clinical status of the patient at the time of the index admission. Accordingly, only comorbidities that convey information about the patient at that time or in the 12 months prior, and not complications that arise during the course of the hospitalization, are included in the risk adjustment.

The measure does not adjust for socioeconomic status (SES) because the association between SES and health outcomes can be due, in part, to differences in the quality of health care that groups of patients with varying SES receive. The intent is for the measure to adjust for patient demographic and clinical characteristics while illuminating important quality differences. As part of the National Quality Forum's (NQF's) endorsement process for this measure, the Centers for Medicare & Medicaid Services (CMS) completed analyses for the two-year Sociodemographic Trial Period. Although univariate analyses found that the patient-level observed (unadjusted) complication rate is higher for dual-eligible patients (for patients living in lower Agency for Healthcare Research and Quality [AHRQ] SES Index census block groups) and African-American patients compared with all other patients, analyses in the context of a multivariable model demonstrated that the effect size of these variables was small, and that the c-statistics for the model are similar with and without the addition of these variables.

Refer to Appendix D in the original measure documentation for the list of comorbidity risk-adjustment variables and the list of complications that are excluded from risk adjustment if they only occur during the index admission.

Standard of Comparison

not defined yet

Identifying Information

Original Title

Hospital-level RSCR following elective primary THA and/or TKA.

Measure Collection Name

National Hospital Inpatient Quality Measures

Measure Set Name

Complication Measure

Submitter

Centers for Medicare & Medicaid Services - Federal Government Agency [U.S.]

Developer

Centers for Medicare & Medicaid Services - Federal Government Agency [U.S.]

Yale-New Haven Health Services Corporation/Center for Outcomes Research and Evaluation under contract to Centers for Medicare & Medicaid Services - Academic Affiliated Research Institute

Funding Source(s)

Centers for Medicare & Medicaid Services (CMS)

Composition of the Group that Developed the Measure

This measure was developed by a team of experts:

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Financial Disclosures/Other Potential Conflicts of Interest

None

Endorser

National Quality Forum - None

NQF Number

not defined yet

Date of Endorsement

2017 Jan 25

Core Quality Measures

Orthopedics

Measure Initiative(s)

Hospital Compare

Hospital Inpatient Quality Reporting Program

Adaptation

This measure was not adapted from another source.

Date of Most Current Version in NQMC

2017 Mar

Measure Maintenance

Annual

Date of Next Anticipated Revision

2018 Apr

Measure Status

This is the current release of the measure.

This measure updates a previous version: Specifications manual for national hospital inpatient quality measures, version 5.0b. Centers for Medicare & Medicaid Services (CMS), The Joint Commission; Effective 2015 Oct 1. various p.

Measure Availability

Source available from the [QualityNet Web site](#) .

Check the QualityNet Web site regularly for the most recent version of the specifications manual and for the applicable dates of discharge.

Companion Documents

The following are available:

Hospital compare: a quality tool provided by Medicare. [internet]. Washington (DC): U.S. Department of Health and Human Services; [accessed 2015 May 27]. This is available from the [Medicare Web site](#) .

Yale New Haven Health Services Corporation (YNHHSC), Center for Outcomes Research and Evaluation (CORE). Medicare hospital quality chartbook: performance report on outcome measures. Baltimore (MD): Centers for Medicare & Medicaid Services (CMS); 2016 Sep. Available from the [CMS Web site](#) .

Yale New Haven Health Services Corporation (YNHHSC), Center for Outcomes Research and Evaluation (CORE). 2017 procedure-specific complication measure updates and specifications report: supplemental ICD-10 code lists for use with claims for discharges on or after October 1, 2015. Baltimore (MD): Centers for Medicare & Medicaid Services (CMS); 2017. Available from the [QualityNet Web site](#) .

NQMC Status

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